



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,342	07/14/2006	Yasuhiko Okita	070456-0120	2795
20277 7590 02/14/2008 MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096			EXAMINER ADDISU, SARA	
			ART UNIT 3722	PAPER NUMBER
			MAIL DATE 02/14/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/586,342

Applicant(s)

OKITA ET AL.

Examiner

Sara Addisu

Art Unit

3722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 7/14/06, 10/26/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☒ Other: attachment I

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi (USP 5,044,839), in view of Kanada et al. (USP 6,612,786) and further in view of Mizutani (USP 5,707,187).

TAKAHASHI teaches an insert having an upper surface with an apical angle part and having a polygonal shape in top view and forming an edge and a chip breaker (7), said chip breaker has a substantially symmetrical shape with respect to a section bisecting the apical angle of said apical angle part, and has a protrusion (6) and a flat part (3a: with shear angle of 0 degrees) provided between said protrusion and said apical angle part ('839, figures 1 and 11). TAKAHASHI also teaches a pair of arcuate ridges (R1 & R2: see figure below) on the apex of said protrusion (6). Please refer to attachment I for the detailed explanation of how TAKAHASHI reads on the angle (X) formed by the tangential line of the arcuate ridge at a point bisecting the arcuate ridge of the protrusion and a bisector of the apical angle. Regarding claims 1, 5 and 6, TAKAHASHI discloses the claimed invention (i.e. ridge length,

distance and height difference of the forward end of said apical angle part and first intersection (P), i.e. the height of the chip breaker) except for height difference being in the range of at least 0.02 mm and not more than 0.5 mm or the distance being between 0.1 mm - 2 mm or line segment ration as claimed. It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary ridge length (depending on the size of the insert), distance from the corner and the height of the chip breaker depending on the application of the tool and the thickness of the insert (as evidenced by De Beaupre et al., US Pub. No. 2003/0063955, paragraph 22, which states "The actual height of the chip breaker will depend on the overall size of the cutting insert and the intended application"), because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Please note although TAKAHASHI fails to teach an indexable insert, it is old and well known to have an indexable insert for the purpose of increasing the number of cutting edges.

However, TAKAHASHI fails to teach the insert being prepared by bonding a superhard sintered body (with a surface roughness of 0.1-0.5 μ m) containing cubic boron nitride to at least the upper surface of an apical angle part of the insert body. TAKAHASHI also fails to teach a chamfer/land being formed on the intersection between the upper surface and the side surface.

KANADA ET AL. teaches an insert having a hard sintered polycrystalline body (11) containing a cubic crystal boron nitride (CBN) bonded to the upper surface of an

apical angle part of the insert body ('786, figure 1 and col. 1, lines 8-11). KANADA ET AL. also teaches the surface roughness on the rake face of the tool ranges from $0.1\mu\text{m}$ to $0.5\mu\text{m}$ according to the average roughness (R_z) of the ten point system ('786, col. 2, lines 20-23). Furthermore, KANADA ET AL. teaches another aspect of the invention where a coated layer is formed on the surface of the polycrystalline hard sintered body by a chemical or physical vapor deposition, such that the wear at the ridge of the cutting edge is reduced thereby, so that the roughness on the finished surface of the work piece may be improved, and the life of the tool may be lengthened ('786, col. 6, lines 30-35). Furthermore, KANADA ET AL. teaches that it is preferable that the coated layer comprises at least one kind element selected from groups comprising elements of 4a, 5a and 6a groups corresponding to the periodic table and elements of Al, Si and B nitride and it is also preferable that the coated layer comprises at least one kind compound selected from nitride, carbide and oxide being at least one kind of metals selected from said groups and solid solution of nitride, carbide and oxide ('786, col. 14, lines 52-60) KANADA ET AL. also teaches a negative land (14) of 65 degrees or more to 125 degrees or less ('786, figure 2 and col. 2, lines 30-33).

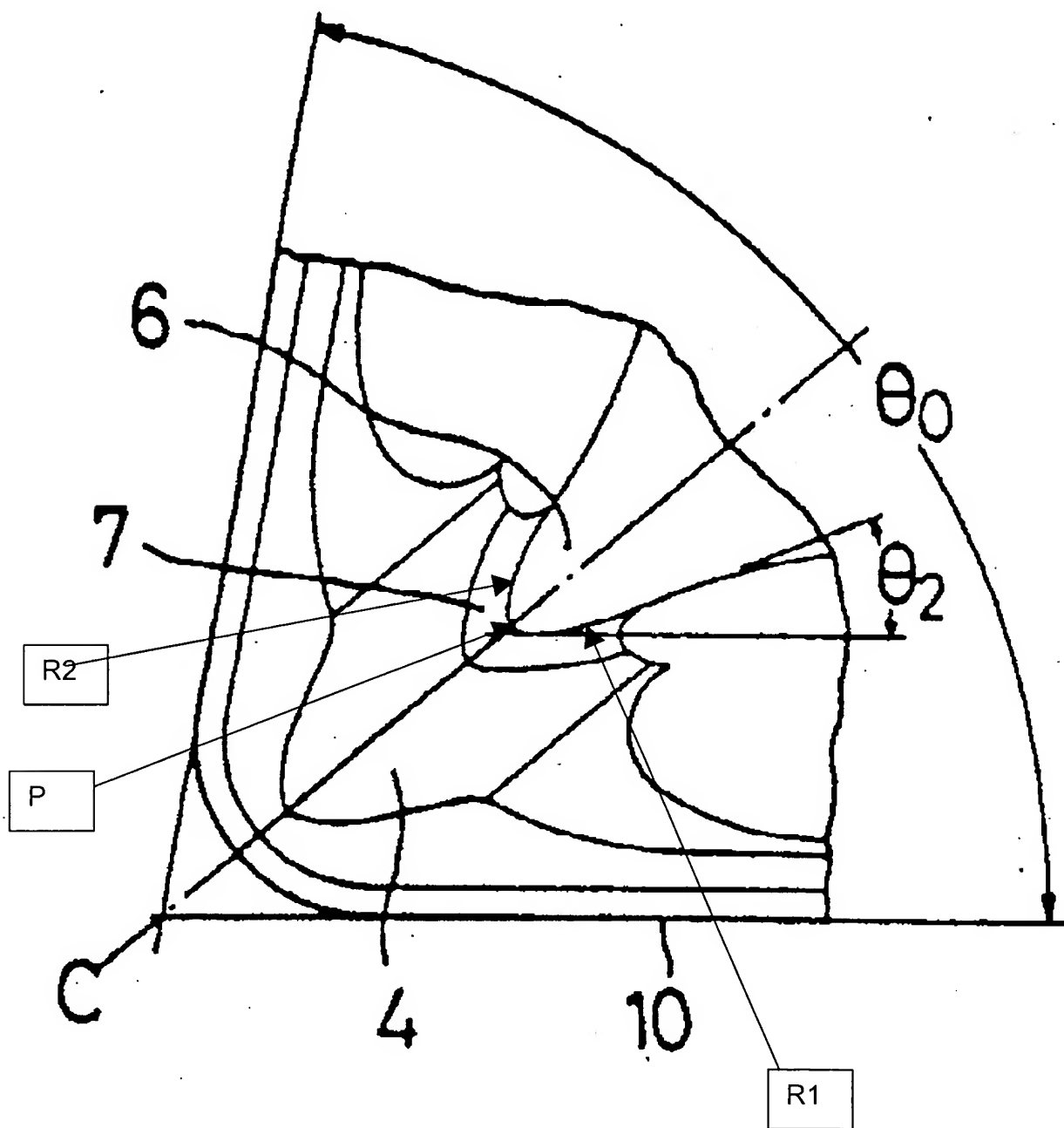
MIZUTANI teaches an indexable insert having a metal base made of cemented carbide, and a cutting edge consisting of a sintered CBN compact and a flat drag type cutting edge which are brazed to the metal base or bonded thereto by integral sintering ('185, figures 3A & 3b). MIZUTANI also teaches a negative land/chamfer having an

angle (θ) of 30-45 degrees (thus meets the limitation 15 to no more than 45 degrees claimed in claim 3) and a width (L) of 0.05 to 0.40 mm (thus meets the limitation 0.02mm to no more than 0.2mm claimed in claim 4) ('185, figures 19 & 20 and abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify TAKAHASHI such that it has a hard sintered polycrystalline body (11) containing a cubic crystal boron nitride (CBN) bonded to the upper surface of an apical angle part, as taught by KANADA ET AL. for the purpose of enabling cutting with high precision ('786, col. 3, lines 28-30). It would have also been obvious to one of ordinary skill in the art at the time of the invention was made to modify TAKAHASHI such that its surface roughness on the rake face (i.e. flat surface and chamfer) ranges from $0.1\mu\text{m}$ to $0.5\mu\text{m}$, as taught by KANADA ET AL. for the purpose of prolonging the tool life of the cutting tool ('786, col. 2, lines 20-27). Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify TAKAHASHI such that it has a negative land/chamfer (having an angle and width as stated above), as taught by MIZUTANI for the purpose of having excellent cutting performance and the tool life can be extended ('185, abstract and col. 1, lines 22-25 & col. 2, lines 16-21 & 55-58).

The modified device of TAKAHASHI discloses the claimed invention (i.e. an insert with a chamfer) except for the width of the chamfer being 0.02mm – 0.2 mm). It would have been obvious to one having ordinary skill in the art at the time the invention

was made to vary the chamfer/land width depending on the application of the tool (as evidenced by Johnson, USP 5,876,160, col. 1, lines 58-62, which states "varying width of cutting edge land is not unknown in the metal cutting art"), because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.



Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sara Addisu at (571) 272-6082. The examiner can normally be reached on 8:30 am - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Monica Carter can be reached on (571) 272-4475. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sara Addisu
(571) 272-6082

SP
1/16/08

Monica S. Carter
MONICA CARTER
SUPERVISORY PATENT EXAMINER

According

to the instant invention

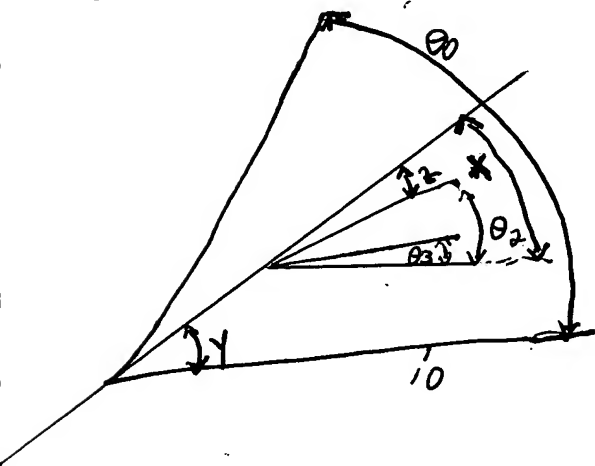
 θ is

$$\frac{6}{10} \times \alpha \leq \theta \leq 90 - \frac{1}{10} \times \alpha$$

~~given $\alpha = 80^\circ$~~

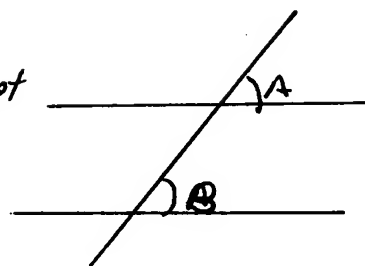
$$\text{since } \alpha \text{ is } 80^\circ \Rightarrow 48^\circ \leq \theta \leq 82^\circ$$

Fig 11 of '839



given the concept of

$$A^\circ = B^\circ$$

in '839 $x^\circ = y^\circ$ 

'839 col 4, lines 36 states

$$1^\circ \leq \theta_2 \leq \theta_0/2$$

max θ_0 can be is 90°

$$\text{thus } 1^\circ \leq \theta_2 \leq 90/2 (45^\circ)$$

$$1^\circ \leq \theta_2 \leq 45^\circ$$

since θ_0 is already has a possible max degree of 45° $\therefore x^\circ = \theta_2 + 2^\circ$

~~the~~ x° will fall in the claimed range of

$$\underline{\underline{48^\circ \leq \theta \leq 82^\circ}}$$